

## STATEMENT

on the dissertations for obtaining the educational and scientific degree 'Doctor', in the field of higher education 6. Agrarian sciences and veterinary medicine, professional area 6.5. Forestry, scientific specialty 'Forest reclamation, forest protection and special uses in forests' in Forest Research Institute – Bulgarian Academy of Sciences

**Author of the dissertation:** Pavel Yordanov Topalov, Forest Research Institute – Bulgarian Academy of Sciences

**Dissertation topic:** Species composition, distribution and bioecological features of longhorn beetles (Coleoptera, Cerambycidae) on Vitoshka

**Member of the scientific jury:** Prof. Dr. Margarita Ilieva Georgieva, Forest Research Institute - Bulgarian Academy of Sciences, appointed as a member of the scientific jury by Order No. 15-138 of 23.04.2025.

### **1. Brief introduction of the doctoral student.**

Doctoral PhD student of independent training Pavel Yordanov Topalov was born on 28.09.1975 in Sofia. In 2002, he obtained the educational qualification degree 'Master' in Biology with specialization 'Zoology of Vertebrates and Anthropology' at the Faculty of Biology at Sofia University 'St. Kliment Ohridski'. During the period 2001-2018, P. Topalov worked as a primary school teacher, biology teacher, extracurricular activity leader, etc. His areas of scientific interests include: entomology - studies on the species composition and distribution of representatives of the Cerambycidae family, and herpetology.

Since 2023, P. Topalov has been enrolled as a PhD student of independent training in the Section of Forest Entomology, Phytopathology and Game Fauna at the Forest Research Institute. During his studies, the PhD student meets the requirements for implementing the educational and scientific program of the Doctoral Training Center at the Bulgarian Academy of Sciences, and with a required score of 250 points, he achieves 582 points.

### **2. General characteristics of the dissertation - volume and structure.**

In connection with the conducted comprehensive study on the species composition, distribution and bioecological features of the established species of the longhorn beetles (Coleoptera, Cerambycidae) on Vitoshka Mountain, a dissertation thesis is presented, including 200 pages, of which 182 pages are text and 18 pages are a list of used literature. The most extensive is the Results section, placed on 130 pages with color maps of the localities of the established species of longhorn beetles on Vitoshka, 11 tables and 140 figures.

### **3. Relevance of the problem.**

The developed dissertation thesis presents a scientific study on economically important for Bulgarian forests insect species – the longhorn beetles. The relevance of the topic is determined by the fact that some of the representatives of the family. Cerambycidae manifest themselves as dangerous stem pests in forests, developing on physiologically weakened hosts. A large part of the species are saprophages, which contribute to the decomposition of dead wood, therefore they have high conservation significance. The present work is dedicated to current scientific problems related to obtaining new data on the vertical distribution, phenology, trophic relationships with host plants and the zoogeographical affiliation of the longhorn beetles species in the Vitoshka region, which determine the significance of the study.

#### **4. Literary awareness.**

The presented list of literary sources includes 318 titles, of which 87 in Cyrillic and 231 in Latin. With regard to the analysis of the state of the problem, in the literature review the PhD student made an extensive review of scientific studies related to the distribution, trophic relationships and conservation significance of the established species of the Cerambycidae family in Bulgaria, and in a separate subsection - also of the species established on the Vitosha Mountain. The analysis of the large number of literary sources has allowed to justify the set goal and to define the tasks of the study.

#### **5. Aim, tasks and research methods.**

The significance and relevance of the problem are the basis for formulating the set goal of the dissertation work, choosing the methods of the research, as well as the set tasks. The purpose of this dissertation work is to conduct a comprehensive study on the longhorn beetles on Vitosha Mountain. In developing the dissertation, the following specific tasks were solved: establishing the species composition of the longhorn beetles complex on Vitosha; clarifying the horizontal and vertical distribution of the longhorn beetles; studying the food plants of the individual longhorn beetles species and the trophic characteristics of the family; performing an arealographic analysis of the longhorn beetles complex on Vitosha; studying the parasitoids of sawflies that act as pests; clarifying the protective status of the longhorn beetles on Vitosha.

#### **6. Significance of the obtained results, interpretations, visualization and conclusions.**

The data on the distribution, chorology, biology and ecology of the longhorn beetle species found on Vitosha Mountain have been analysed. New beetle species have been identified for the cerambycid fauna in the region. New trophic relationships of cerambycids with tree species such as *Quercus dalishampii*, *Q. cerris*, *Fagus sylvatica*, *Prunus avium*, *Pinus peuce*, etc. have been revealed. A database has been created for all finds that have been mapped.

The presented dissertation work is based on a large amount of collected biological material and is the first comprehensive study of the beetle complex on Vitosha. It has made significant scientific and applied science contributions of a faunal, ecological and methodological nature. The study of beetles on the territory of Vitosha Mountain has led to the identification of 131 beetle taxa (Coleoptera: Cerambycidae), belonging to 7 subfamilies. The cerambycid fauna of Vitosha has been enriched with 15 new taxa. Information on new localities in the region has been obtained for another 60 species and subspecies, including seven taxa rare for the country.

The vertical distribution of the species of cerambycids has been established. The greatest diversity has been established in the belt of xeromesophilic and mesophilic oak-hornbeam forests – 115 taxa. 50 cerambycid taxa have been found in the belt of beech forests, 23 taxa in the belt of coniferous forests, and three taxa in the belt of subalpine vegetation. An arealographic characteristic of the cerambycids of Vitosha has been prepared, which shows that the most numerous share is that of the representatives of the European complex (40.5%).

85 species of the family Cerambycidae of Vitosha, included in international and national lists of protected species and species of conservation importance, are presented.

Six species of parasitoids from three families of cerambycids have been identified on Vitosha, with one species being new to Bulgaria.

## **7. Contributions to the dissertation.**

The results obtained in the dissertation are current and significant, reflecting the achievements of the doctoral student. Scientific and applied scientific contributions of a faunal, ecological and methodological nature have been achieved, the most important of which are the following:

- The available information in the entomological literature on the species of longhorn beetles (Coleoptera: Cerambycidae) found on Vitosha has been summarized.
- The first targeted complex studies on the distribution, biology and ecology of beetles (Coleoptera: Cerambycidae) on Vitosha have been conducted.
- Fifteen new species and subspecies of beetles have been identified for Vitosha, four new genera (*Aegosoma*, *Pedostrangalia*, *Trichoferus*, *Hylotrupes*) and three new tribes (*Aegosomatini*, *Hesperophanini*, *Hylotrupini*) have been identified.
- New faunal data for the studied area have been presented, including seven taxa rare for the country.
- 24 new trophic relationships between cerambycids with woody and shrubby plants have been established for the country.
- A new parasite-host relationship for Bulgaria has been established between *Billaea triangulifera* and *Prionus coriarius*.

## **8. Critical remarks and questions.**

I have no critical remarks or questions to the doctoral student. Minor technical errors have been made in the text. All recommendations made during the testing of the material have been reflected by the doctoral student in this dissertation.

## **9. Evaluation of the quality of scientific publications.**

The main results of the dissertation work, related to the establishment of new finds of Vitosha cutworms, new trophic-host and parasite-host relationships, have been published in five articles in peer-reviewed scientific journals, two of which have been published in a journal with an Impact Factor – *Acta zoologica bulgarica*. In one publication, doctoral student P. Topalov is an independent author and in one he is the first author.

## **10. Personal contribution of the doctoral student.**

In developing her dissertation, the doctoral student has achieved original scientific and applied scientific contributions, which I accept as the doctoral student's personal work, and which fully correspond to the scientific specialty in which the study was developed. Particularly valuable are the results related to the presentation of new faunal data for cerambycids in the studied area, including seven taxa rare for the country, which requires good theoretical and methodological preparation on the part of the doctoral student.

## **CONCLUSION:**

The dissertation thesis of PhD student Pavel Yordanov Topalov is an original scientific work dedicated to a current topic of research on the species composition, distribution and bioecological features of longhorn beetles (Coleoptera, Cerambycidae) of Vitosha. Based on the different research methods learned and applied by the PhD student, the correctly performed experiments, the summaries and conclusions made, I believe that the presented dissertation meets the requirements of Law for Development of the Scientific Staff of the Republic of Bulgaria and the Regulations on the terms and conditions for obtaining the educational and scientific degree and holding academic positions in Forest Research Institute - BAS, which gives me reason to evaluate it **POSITIVE**.

I allow myself to propose to the esteemed Scientific Jury to vote positively and to award to **Pavel Yordanov Topalov** the educational and scientific degree '**Doctor**' in the field of higher education 6. Agricultural Sciences and Veterinary Medicine, professional field 6.5. Forestry, scientific specialty 'Forest reclamation, forest protection and special uses in forests'.

**Date: 3.6.2025**  
**Sofia**

**PREPARED THE STATEMENT:**  
**/Prof. Margarita Georgieva, PhD/**